A. H. OBENHOFF & D. J. BRODERICK.

TAKE-UP FOR KNITTING MACHINES.

APPLICATION FILED JULY 1, 1909.

980,826. Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.

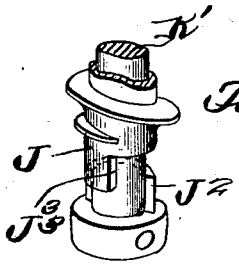


Fig. 8.

Fig. 1.

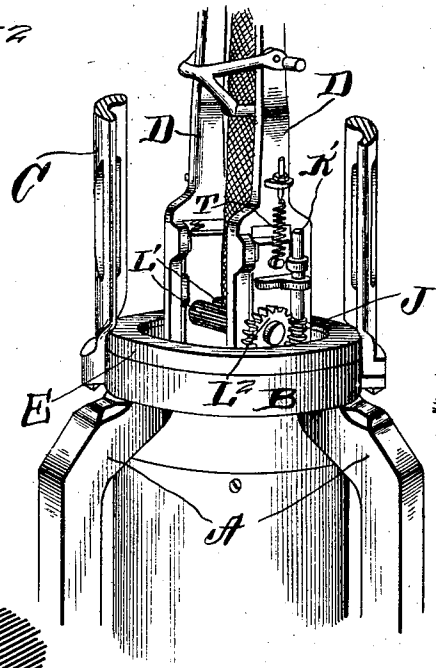


Fig. 7.

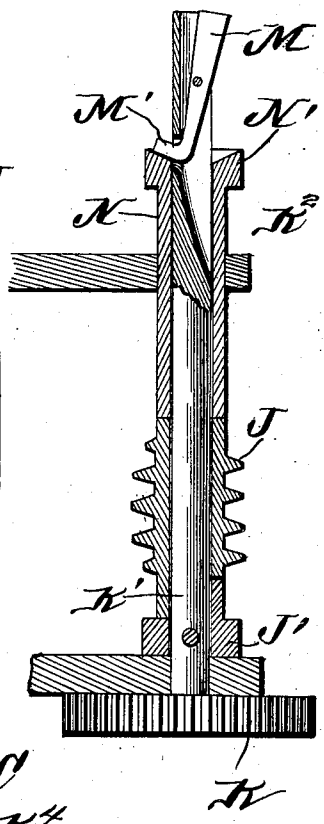


Fig. 6.

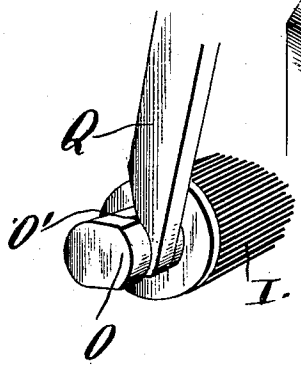
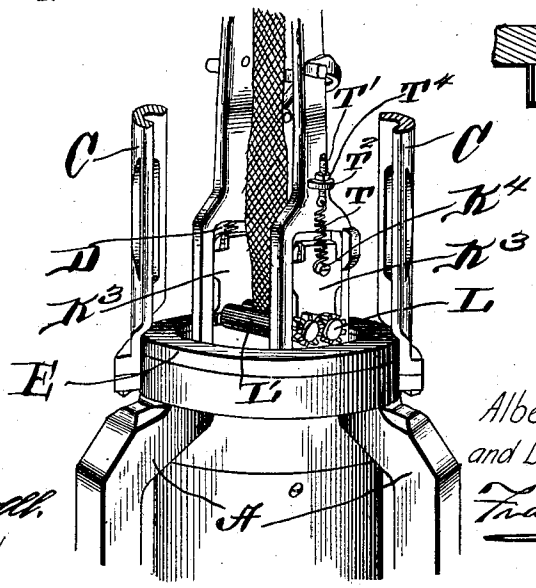


Fig. 2.



Witnesses

R. A. Bosworth.

W. Welch.

Inventors

Albert H. Obenhoff

and Dennis J. Broderick

By Franklin H. Hough

Attorney

A. H. OBENHOFF & D. J. BRODERICK.

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2 SHEETS—SHEET 2.

Fig. 3.

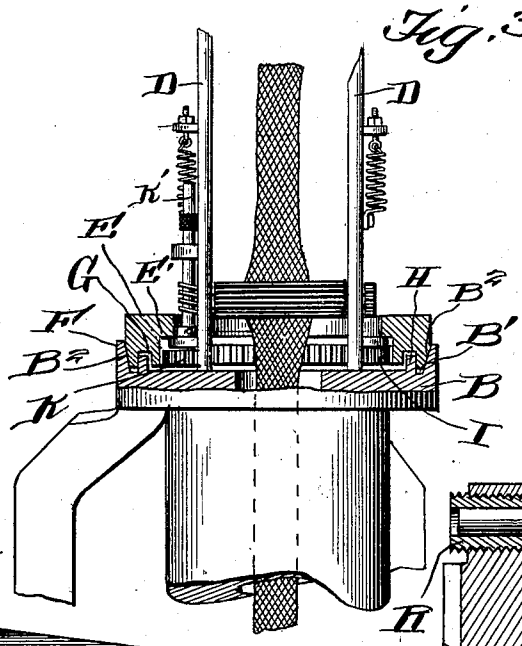


Fig. 4.

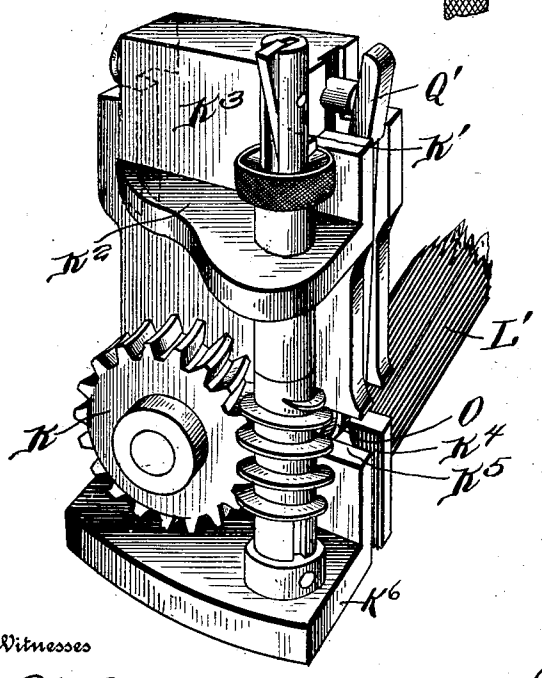
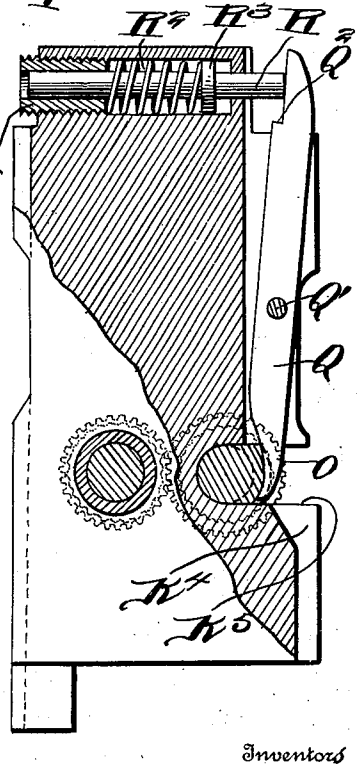


Fig. 5.



Witnesses

R. H. Fourace.

W. Welch.

Inventors

Albert H. Obenhoff and

Dennis J. Broderick

By Franklin N. Hough

Attorney

UNITED STATES PATENT OFFICE.

ALBERT H. OBENHOFF AND DENNIS J. BRODERICK, OF GLOVERSVILLE, NEW YORK.

TAKE-UP FOR KNITTING-MACHINES.

980,826. Specification of Letters Patent. **Patented Jan. 3, 1911.**

Application filed July 1, 1909. Serial No. 505,483.

To all whom it may concern:

Be it known that we, ALBERT H. OBENHOFF and DENNIS J. BRODERICK, citizens of the United States, residing at Gloversville, in the county of Fulton and State of New York, have invented certain new and useful Improvements in Take-Ups for Knitting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in take-up apparatus for knitting machines and comprises essentially movable blocks carrying tension rollers between which the article being knit passes and adapted to automatically take up any slack and at all times keeping the portion of the knit article taut.

The invention comprises various details of construction, combinations and arrangements of parts which will be hereinafter fully described and then specifically defined in the appended claims.

We illustrate our invention in the accompanying drawings, in which:—

Figure 1 is a perspective view of a portion of a knitting machine with the superstructure removed. Fig. 2 is a similar view from the opposite side of the apparatus. Fig. 3 is a vertical sectional view through the apparatus showing the friction disk in engagement with the wall of a groove in the table of the machine. Fig. 4 is an enlarged detail perspective view of one of the movable roller carrying blocks. Fig. 5 is a sectional view through a portion of the block shown in Fig. 4. Fig. 6 is an enlarged detail view of a spring-actuated tension lever bearing against a boxing forming a bearing with one of the rollers. Fig. 7 is a detail sectional view through the hollow worm shaft shown in Fig. 4 of the drawings, and Fig. 8 is an enlarged detail perspective view of the worm and the shaft upon which the same is mounted.

Reference now being had to the details of the drawings by letter, A, A, designate the legs of the apparatus and B a table having a circular outlined grooved way B′, the outer wall of which, designated by letter B^2, is inclined, as shown clearly in Fig. 3 of the drawings. Rising from said table are the standards C which are adapted to support the superstructure of the usual knitting machine but which is eliminated from the drawings as it forms no part of the present invention. Mounted to rotate with the superstructure are the arms D having their lower ends forked to receive the movable blocks K^3, the lower end of which has a laterally extending flange K^6, and each block has a longitudinal groove K^8 shown in dotted lines in its opposite longitudinal edges engaged by ribs on the inner edges of the forked arm of the rod D to guide the blocks. The ring E rests loosely upon said flanges K^6 of said blocks and said ring is provided with a flange F inclined upon its outer face and conforming to the inclination of the wall B^2 in said table against which it is adapted to contact when there is any slack in the article being knit. Said ring is provided with an annular groove G formed in its lower edge and adapted to receive the annular flange H which rises from said table. Upon the inner periphery of said ring is a series of rack teeth I which are in engagement with the teeth of the pinion wheel K which is fixed to the bottom of the vertically disposed shaft K′, which latter is journaled in suitable bearings in the laterally projecting portions K^2 and K^6 of the block K^3. Said blocks have journaled in suitable bearings therein two positively driven rollers L and L′, and L^2 designates a pinion wheel which is fixed to the spindle end of the roller L and is adapted to mesh with a hollow worm J which is adjustably mounted upon the vertically disposed shaft K′. Gear wheels L^4 are mounted upon corresponding ends of said rollers and intermesh with each other, as shown in Fig. 2 of the drawings. Fixed to said shaft K′ is a collar J′, the upper shank portion of which is cut away forming a clutch tooth J^2 and the lower end of said worm J is also cut away forming a clutch tooth J^3 which is normally held by gravity so as to engage the tooth J^2. Mounted in an aperture in the projection K^2 of said block is a sleeve N, the upper end of which has a milled flange N′ and the lower end of said sleeve is adapted to rest upon the upper end of the worm J. A spring-pressed pawl, designated by letter M, is pivotally mounted within a recessed portion of the shaft K′ and said pawl is

provided with an angled end M′ which projects through said recess in the shaft K′ and is adapted to normally hold the sleeve in the position shown in Fig. 7 of the drawings, thereby holding the worm in mesh with the teeth of the pinion wheel K and affording a convenient means whereby, when it is desired to throw the worm out of mesh with the pinion wheel K, it may be done by tilting the pawl M and allowing the sleeve to be removed and also to raise the worm vertically upon the shaft K′ out of engagement with said pinion K. The roller L′ is mounted in horizontally disposed recesses K^5 in said blocks, the inner ends of said recesses being concaved and coöperating with the bearing blocks O having parallel flattened portions O^2 which blocks O coöperate with the end walls of the recesses K^5 to form bearings for the spindle ends of the rollers L′. Each of said bearing blocks O, a detail of one of which is shown in Fig. 6 of the drawings, has a recess O′ upon its outer convexed edge and adapted to be engaged by a tension lever Q, shown clearly in Figs. 5 and 6 of the drawings, which is pivotally mounted upon a pin Q′ within a vertically disposed recess K^4 in the edge of each block K^3. The lower end of each lever Q is slightly concaved as at Q^3 and engages the bearing block O in the manner shown and its upper end has a recess terminating in a shoulder Q^2.

Mounted within a transverse aperture in the upper end of each block is a tension regulating pin, designated by letter R, the inner end of which slides within a hollow screw R′ engaging the threads in the wall of said transverse aperture and the other end of the pin is adapted to engage the marginal edge of the recess formed in the upper end of the lever. A coiled spring R^2 is interposed between the inner end of said hollow screw and a collar R^3 upon the pin R and tends to hold the pin yieldingly against the end of the lever Q. By turning the screw R′ in one way or another, the tension of the spring R^2 may be regulated for the purpose of increasing the tension upon the roller L′.

Referring to Figs. 1 and 2 of the drawings, it will be noted that each of said blocks K^3 has a screw K^4 projecting therefrom, and T designates a coiled spring fastened at one end to said screw and its other end to a rod T′ which passes through a bracket extension T^2 and the lower end of each rod T′ has an eye T^3 to which the upper end of the coiled spring T is connected. By means of a nut T^4 mounted upon the threaded end of the rod T′, the tension of the spring T may be regulated. Each of said blocks has a similar spring connected thereto, as shown in Figs. 1 and 2 of the drawings. By means of these springs, the tension of the springs which support the blocks and the rollers carried thereby may be conveniently regulated.

In operation, the flanges K^6 of the blocks K^3 coöperate with the shoulder of the friction ring to support the latter, said blocks being rotated with said arms and the superstructure of the knitting machines by the usual mechanism in knitting machines. The friction ring resting upon said flanges of the block will normally rotate with said block and arms and the rollers between which the article being knitted is frictionally held, it being understood that the friction ring and the block supporting the same rotate together and at the same speed. While there is tension upon the article being knit and, as the parts rotate together, the friction rollers are idle as far as feeding the article being knit between the same is concerned. As the article is being knit and any slack therein appears, the weight of the friction ring and parts carried thereby will cause said ring to frictionally engage the inclined wall of the annular groove in said table and have a tendency to slightly arrest the rotary movement of the ring E sufficient to cause a slight intermittent rotary movement to be imparted to the rollers between which the article being fed passes, thereby causing the slack to be taken up by the article being fed between the rollers. This being done and the article again being taut will have a tendency to raise the friction ring from contact with the inclined wall of the annular groove of the table and allow the ring and the arms supporting the same to rotate together, thus automatically taking up the slack in the article being knit without any sudden jar and forming a uniformity in the knitting of the article.

In the event of it being desired for any purpose, as it frequently happens in machines of this nature, to remove the article being knit from the rollers, provision is made for so doing by simply depressing the pawl M and allowing the sleeve engaged by the pawl to be moved upward upon the shaft K′ and the worm also raised out of engagement with the pinion wheel K, thus throwing the apparatus out of gear. By depressing the upper end of the lever Q′, tension may be relieved from the roller and which latter allows the same to separate from the other roller.

What we claim to be new is:—

1. A take-up mechanism for knitting machines, comprising a stationary friction table, rotatable arms, movable blocks carried by said arms, rollers mounted in bearings in said blocks and adapted to engage the article being knit to hold the same taut, a friction ring supported loosely upon said arms, series of gear teeth upon the inner periphery of said ring, a vertically disposed rotatable shaft mounted upon one of said

blocks, a pinion wheel keyed to said shaft and adapted to mesh with said gear teeth, a hollow worm upon said shaft, a clutch tooth upon said worm and a collar fixed to said shaft and having a clutch tooth, a pinion wheel upon the spindle end of one of said rollers and in mesh with said worm, a movable sleeve mounted upon said shaft and adapted to bear against said worm, and a pawl carried by the shaft and adapted to hold said sleeve in place, as set forth.

2. A take-up mechanism for knitting machines, comprising a stationary friction table, rotatable arms, movable blocks carried by said arms, rollers mounted in bearings in said blocks and adapted to engage the article being knit to hold the same taut, a friction ring supported loosely upon said arms, series of gear teeth upon the inner periphery of said ring, a vertically disposed rotatable shaft mounted upon one of said blocks, a pinion wheel keyed to said shaft and adapted to mesh with said gear teeth, a hollow worm upon said shaft, a clutch tooth upon said worm and a collar fixed to said shaft and having a clutch tooth, a pinion wheel upon the spindle end of one of said rollers and in mesh with said worm, a movable sleeve mounted upon said shaft and adapted to bear against said worm, a spring-pressed pawl pivotally mounted in a recess in said shaft and having a projecting portion designed to hold the sleeve from longitudinal movement, as set forth.

3. A take-up mechanism for knitting machines, comprising a stationary friction table, rotatable arms, movable blocks carried by said arms, rollers mounted in bearings in said blocks and adapted to engage the article being knit to hold the same taut, a friction ring supported loosely upon said arms, series of gear teeth upon the inner periphery of said ring, said blocks having laterally projecting apertured portions with registering apertures, a shaft journaled in one of said apertures, a removable sleeve mounted in the other aperture and through which said shaft passes, a sleeve fixed to said shaft and having a clutch tooth, a hollow worm mounted upon said shaft and provided with a clutch adapted to engage the clutch tooth of said sleeve, and a pinion wheel upon the spindle of one of said shafts engaging said worm, as set forth.

4. A take-up mechanism for knitting machines, comprising a stationary friction table, rotatable arms, movable blocks carried by said arms, a stationary rotatable roller mounted in said blocks, a second roller mounted in recesses in said blocks, pivotal spring-actuated tension levers, one mounted on each block and adapted to hold said second roller yieldingly against said stationary roller, a gear wheel fixed to the spindle of one of said rollers, a vertically disposed rotatable shaft, a pinion fixed thereto, a friction ring supported by said blocks and having gear teeth thereon which are in mesh with said pinion, a hollow worm mounted upon said shaft and engaging the teeth of said gear wheel, as set forth.

5. A take-up mechanism for knitting machines, comprising a stationary friction table, rotatable arms, movable blocks carried by said arms, friction ring supported loosely by said blocks and provided with a series of gear teeth, a stationary rotatable roller mounted in said blocks, a second roller mounted in recesses in said blocks, bearing members loosely mounted one in each recess in said blocks and adapted to coöperate with the end walls of the recesses to form bearings for said second roller, gear connections between one of the rollers and the teeth of said friction ring, a lever pivotally mounted upon each block and adapted to bear against said bearing member, and a spring-pressed tension pin carried by each block and adapted to bear against said lever, as set forth.

6. A take-up mechanism for knitting machines, comprising a stationary friction table, rotatable arms, movable blocks carried by said arms, a spring connected to each of said blocks, an adjustable rod carried by each arm and adapted to engage each one of said springs, rollers mounted in bearings in said blocks and adapted to engage the article being knit to hold the same taut, a friction ring supported loosely upon said arms, series of gear teeth upon the inner periphery of said ring, a vertically disposed rotatable shaft mounted upon one of said blocks, a pinion wheel keyed to said shaft and adapted to mesh with said gear teeth, and adjustable gear connections between said shaft and one of said rollers, as set forth.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

ALBERT H. OBENHOFF.
DENNIS J. BRODERICK.

Witnesses:
F. S. Sexton,
F. P. Rightmyer.